

Fireweed a good parent, but a poor competitor for sunlight with the big boys

by Ed Berg

The fireweed blossoms are moving inexorably up the stem, more or less hitting the halfway point this week, and reminding us that fall is not far away.

Fireweed is certainly one of our most beautiful plants, both up close for its showy flowers and for the flaming floral tint of our fall meadows and hillsides.

If you look at a flowering spike of fireweed right now, you will see the long seedpods on the bottom, the mature flowers in the middle, and unopened buds on the top. In the next few weeks the top of the spike will elongate, continuously adding new buds as the flowers below become mature and form their seedpods. If winter were to arrive early, no new buds would form. Conversely, if summer were to extend another month, extra buds would be added for more flowers and more seedpods. Botanists call this “indeterminate” growth, and contrast it with determinate growth where the genetic program produces a fixed number of flowers on the stem, for example, tulips and twinflowers.

The parts of a mature fireweed flower come in “fours:” four narrow sepals, four petals, eight stamens (each with a double pollen bag or anther on its tip), and the central style is split into four curls. Among plants, the “fours” pattern is rather uncommon—mustards come to mind as another example.

“Fives” are more common (pink, saxifrage, and heath families), the many lily family members come in “threes,” and the large buttercup and rose families usually have “many” parts.

Keeping these numbers in mind can often help you identify the family of a plant, or at least rule out what family it is not.

I have puzzled about whether fireweed is an annual or a perennial. When you pull up a fireweed, you see several inches of roots, but there is no remnant of last year’s stem. A typical perennial plant has well-developed roots for storage, for example, carrots, dandelions, and trees.

Furthermore, you can often see last year’s stem even if it puts up a new stem every year, like cow parsnip (pushki).

With fireweed, there isn’t an obvious storage root

or last year’s stem, unless you dig in a patch of really large fireweeds.

As with most flowering plants, fireweed can grow from a seed, especially in bare mineral soil, but fireweed propagates best from underground stems, called “rhizomes,” and is thus a perennial.

In late summer the rhizomes produce buds that lie dormant through the winter. One study, for example, found a four-year old fireweed rhizome 20 feet long with 56 buds. In the spring these buds sprout and push up the red shoots (which I find quite tasty). Within a month the new shoots have grown high enough to begin flowering, substantially aided by the initial pulse of parental funding from last year’s rhizome.

The importance of parental support becomes quite obvious if you dig up a few fireweed plants in a well-developed thicket of fireweed; the plants are all connected underground with heavy, almost woody rhizomes.

Contrast this with a single seed-generated plant that “goes it alone” in a garden or on the edge of a road; it will have a few simple roots and won’t be very large, because its tiny seed didn’t hold much food.

Dick Baldwin, in his excellent book *Growing Alaska Natives*, recommends planting a section of root (i.e., rhizome) as the best way to propagate fireweed. If you want to get rid of fireweed, it’s not a good idea to plow it up or disc it, because each piece of broken rhizome can start a new plant.

If fireweed seeds are small in size, they are large in quantity. A typical pod produces 300 to 500 seeds and a single plant can produce as many as 80,000 seeds per year.

Tests have shown 100 percent germination of seeds within 10 days, but the seeds lose viability in 18 to 24 months.

The fire hairs, or cottony plumes that carry the seeds with the wind, are sensitive to humidity. In moist air the plume diameter decreases and its loft is reduced, so that the seed tends to fall in places where there is adequate moisture for germination.

The lofting ability is important for good dispersal

of the seeds. Swedish experimenters found that seeds were commonly aloft for 10 hours per day and could be carried by the wind 60 to 180 miles in a day.

Fireweed is an early colonizer of burned sites, which, along with its color, may account for its name. For example, we have nine permanent plots in the 1947 Burn; one of these plots was in a severely-burned stand of white spruce, cottonwood and birch, where the mineral soil was well exposed by the fire.

Our survey records and photos show that fireweed came in as a wall-to-wall carpet by 1950 with 280,000 stems per acre. It declined steadily to 52,500 stems per acre by 1965, and was gone completely by 1995, because the new birch and alder canopy had closed and reduced the available light.

Fireweed seeds probably colonized the bare mineral soil toward the end of the summer in 1947 after the fire, and by 1950 the underground network of rhizomes would have been well established.

Despite this phenomenal early success, fireweed has its Achilles' heel in being shade-intolerant. In this plot, after twenty years, the slower growing birch and alder simply grew up, over-topped the fireweed, and outcompeted it.

Fireweed can be an important forage crop for moose, especially in the spring before the flowers appear.

One Alaska study found fireweed to have about 12 percent protein in July, with 62 percent dry matter digestibility for moose.

The flowers of fireweed, however, have evolved chemical defenses to prevent the plant from being eaten once reproduction is underway. The flowers contain tannins, which bind up proteins and make them indigestible, so moose avoid eating fireweed after it is in full bloom.

Many plants use the tannin defense; that is why strong black tea can upset your stomach. Tea drinkers know that they can avoid indigestion by adding some milk to their tea. The protein in the milk binds with the tannin, and the resulting lumps are moved on down the gut out of harm's way.

Details for this article came mostly from the Fire Effects Information System Web site: <http://www.fs.fed.us/database/feis/>. This remarkable Web site summarizes the literature on hundreds of species of common wild plants in very readable form. If you can't find it here, you probably don't need to know it.

Ed Berg has been the ecologist at the Kenai National Wildlife Refuge since 1993. For more information about the Refuge, visit the headquarters in Soldotna, call (907) 262-7021. Previous Refuge Notebook columns can be viewed on the Web at <http://kenai.fws.gov>.